In the Specification

Please replace the paragraph beginning at page 5, line 27, with the following rewritten paragraph:

--The invention described ~~in claim 1 is~~ herein comprises a surface treated copper foil for a printed circuit board derived from a copper foil with one side roughened, wherein the copper foil is a surface treated copper foil for processing for laser hole formation and provided with a nickel layer with a thickness of 0.08 to 2.0 μm as an additional metal layer in one side and subjected to the nodular treatment by fine copper particles in the other side.--

Please replace the paragraph beginning at page 6, line 7, with the following rewritten paragraph:

--The surface treated copper foil is a surface treated copper foil subjected to an anti-corrosion treatment produced from an untreated electrodeposited copper foil before surface treatment (in this specification, an untreated copper foil obtained by electrolysis is sometimes referred as to a drum foil) obtained by an electrolysis process or a rolling method and provided with a nickel layer of 0.08 to 2.0 μm thickness in one side and bearing fine copper particles in the other side in order to obtain an anchor effect at the time of adhesion to a substrate (before and hereafter, the treatment is referred as to nodular treatment and the treated face is referred as to the roughened face). In the case of an untreated copper foil obtained by electrolysis, a nickel layer is

to be formed in so-called shiny side and nodular treatment and anti-corrosion treatment are to be carried out in the roughened face side. FIG. 1 shows schematic cross-sectional view of a surface treated copper foil ~~described in claim 1 and claim 2~~. Incidentally, the anti-corrosion treatment layer of the surface treated copper foil is eliminated in the figure. That is same as in the cases of showing the schematic cross-sectional views of other surface treated copper foils and electrodeposited copper foil with carriers.--

Please replace the paragraph beginning at page 7, line 3, with the following rewritten paragraph:

--As a surface treated copper foil having a similar layer constitution, ~~described in the claim 2~~ is a surface treated copper foil for a printed circuit board produced from a copper foil subjected to an anti-corrosion treatment, wherein the surface treated copper foil is a surface treated copper foil for laser hole formation and provided with a cobalt layer of 0.05 to 3.0 μm thickness as an additional metal layer in the surface of one side and subjected to the nodular treatment by fine copper particles in the other side. The surface treated copper foil is a surface treated copper foil described ~~as claim 1~~ elsewhere herein, in which the nickel layer is replaced with the cobalt layer. Consequently, in the description above and hereafter, the nickel layer and the cobalt layer are both referred as the additional metal layer.--

Please replace the paragraph beginning at page 17, line 23, with the following rewritten

paragraph:

--A surface treated copper foil as described ~~in claim 3 and claim 4~~ herein is similar to that described ~~in claim 1 and claim 2~~ elsewhere in the specification in terms of the layer constitution. ~~Claim 3 describes~~ The invention comprises a surface treated copper foil for processing for laser hole formation, wherein the surface treated copper foil is a surface treated copper foil for a printed circuit board obtained by subjecting one face of an electrodeposited copper foil produced by electrolysis in a copper electrolytic solution to nodular treatment and provided with a nickel layer with a thickness of 0.05 to 2.0 μm in a surface of the roughened face of the electrodeposited copper foil and the matte side of the electrodeposited copper foil subjected to the nodular treatment by fine copper particles. And, ~~claim 4 describes~~ the invention also comprises a surface treated copper foil for processing for laser hole formation, wherein the surface treated copper foil is a surface treated copper foil for a printed circuit board obtained by subjecting one face of an electrodeposited copper foil produced by electrolysis in a copper electrolytic solution to nodular treatment and provided with a cobalt layer with a thickness of 0.03 to 3.0 μm in a surface of the roughened face of the electrodeposited copper foil and the matte side of the electrodeposited copper foil subjected to the nodular treatment by fine copper particles.--

Please replace the paragraph beginning at page 18, line 18, with the following rewritten paragraph:

--FIG. 4 shows the schematic cross-sectional view of these surface treated

copper foils. As being understood from FIG. 4, the additional metal layer in these cases is formed in the roughened face side and the side to be employed as an adhesive face to a substrate is in the shiny side to which the fine copper particles are deposited and these are different points from the cases of the surface treated copper foils described ~~in claim 1 and claim 2~~ elsewhere in the specification. Supposing the case using such a surface treated copper foil as an outer layer copper foil of a copper clad laminate, an additional metal layer having a convexoconcave shape similar to the roughened face of the electrodeposited copper foil is positioned in the surface layer on the contrary to that the smooth additional metal layer is positioned in the surface layer in the case of using the surface treated copper foils as described ~~in claim 1 and claim 2~~ elsewhere in the specification.--

Please replace the paragraph beginning at page 19, line 6, with the following rewritten paragraph:

--The role which the additional metal layer; a nickel layer or a cobalt layer, takes at the time of processing by laser are same in these surface treated copper foils as described ~~in the description for claim 1 and claim 2~~ elsewhere in the specification and the reasons for the restriction of the thickness of the nickel layer and the cobalt layer are also same. Here, duplicated description will be omitted. Other characteristics of certain embodiments of the inventions ~~described in claim 3 and claim 4~~ are that the additional metal layer has a convexoconcave shape. Consequently, owing to the effect of the formation of the additional metal layer and owing to the formation of the

convexoconcave shape, the processibility of laser hole formation is improved. Hereafter, the effect of the convexoconcave shape will be manifested in relation to the reflectance of laser. FIG. 5 shows the relation between the surface roughness and the laser reflectance utilizing the difference of the roughness of the roughened face of an untreated copper foil.--

Please replace the paragraph beginning at page 21, line 3, with the following rewritten paragraph:

--The roughness formed in the matte side of an electrodeposited copper foil is as shown in FIG. 6 is a hill-like convexoconcave shape and an additional metal layer is to be formed on the surface of the hill-like shape. Consequently, when laser radiation is started to the additional metal layer surface having the hill-like shape, the temperature increase is supposed to be fastest in the tip parts (the summit parts of the hill-like shape) of the hill-like convexoconcave shape. Generally, it is said that when those having projected parts and flat parts are put in a constant and high temperature atmosphere, as compared with the temperature increase in the flat parts, the speed of the temperature increase in the projected parts reaches about 6 times fast and the same phenomenon supposedly takes place. As a result, starting the radiation of laser causes sharp temperature increase in the tip parts of the hill-like convexoconcave shape of the matte side bearing the additional metal layer and as compared with the case of radiating laser to a smooth face, the additional metal layer easily reaches the boiling point to be melted and evaporated. After that, as described ~~in the description~~

~~regarding claim 1 and claim 2~~ elsewhere in the specification, evaporation of the additional metal layer and the copper foil layer is supposed to continuously take place to make simultaneous removal of the copper foil and the substrate resin layer possible.-

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Please replace the paragraph beginning at page 22, line 1, with the following rewritten paragraph:

--The surface treated copper foils as above-described ~~in claim 1 to claim 4~~ are to be employed for printed circuit board manufacture by carrying out laser hole processing after copper clad laminates are manufactured using these surface treated copper foils as outer layer copper foils; removing the additional metal layers by an etching method, and then conventional etching processes. Consequently, unlike a conformal mask layer, since no previous copper foil removal of the parts where laser radiation is carried out is required, it is possible to make the positioning precision of a circuit excellently high, shorten the process and effectively lower the manufacturing cost of a printed circuit board.--

Please replace the paragraph beginning at page 22, line 13, with the following rewritten paragraph:

-- The surface treated copper foils ~~of claim 1 to claim 4~~ can be manufactured by employing a so-called surface treatment apparatus to generally carry out surface treatment of a copper foil. According to FIG. 7, the manufacturing method will be described.--

Please replace the paragraph beginning at page 26, line 14, with the following rewritten paragraph:

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--The drying part is for a process to be carried out as a final process to wind a surface treated copper foil derived from the untreated copper foil passed through the tanks filled respectively with the above-described various solutions for the respective processes and completed into a roll-like shape. That is, the completed surface treated copper foil still in wet state is passed through a heated drying furnace. Through these processes, the surface treated copper foils ~~described in claim 1 to claim 4~~ of certain embodiments of the present invention are manufactured.--

Please replace the paragraph beginning at page 26, line 23, with the following rewritten paragraph:

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--The thickness of the surface treated copper foils ~~described in claims 1 to 4~~ of some embodiments of the present invention is limited to be as thin as about the nominal thickness of 7 μm in consideration of the present manufacturing technical level of the surface treated copper foils. On the contrary, ~~claims 5 to 16 describe~~ the invention according the other embodiments comprise an electrodeposited copper foil with carrier, an extremely thin copper foil with a nominal thickness thinner than 7 μm, capable to be manufactured by mass production. The extremely thin copper foil is to be employed for manufacturing a high density printed wiring board by being stuck to a polymer insulating substrate such as a glass-epoxy substrate, a phenol substrate, a polyimide and the like by hot press lamination to be a copper clad laminate.--

Please replace the paragraph beginning at page 29, line 3, with the following rewritten paragraph:

--The electrodeposited copper foil with carrier can broadly be divided to peelable types and etchable types. To say the difference by one word, the peelable types are carrier foils to be removed after hot pressing, whereas the etchable types are carrier foils to be removed by an etching method after hot pressing. ~~Claim 5 to claim 10 describe the~~ In certain embodiments of the invention, the electrodeposited copper foil with carriers ~~comprising~~ comprise the latter etchable types and ~~claim 11 to claim 16 describe~~ in other embodiments of the invention, the electrodeposited copper foil with carrier ~~comprising~~ comprise the former peelable types.--

Please replace the paragraph beginning at page 29, line 13, with the following rewritten paragraph:

-- Here, at first, the electrodeposited copper foil with carrier comprising the etchable carrier ~~described in claim 5 to claim 10~~ according to various embodiments of the invention will be described. ~~Claim 5 describes~~ One of these embodiments comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the additional metal layer is a nickel layer with the thickness of 0.08 to 2.0 μm thickness in the smooth surface side of the carrier foil, and the electrodeposited copper foil layer is composed of a bulk layer

and fine copper particles in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation.--

Please replace the paragraph beginning at page 30, line 1, with the following rewritten paragraph:

-- Further, ~~claim 6 describes~~ another of these embodiments comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the additional metal layer is a cobalt layer with the thickness of 0.05 to 3.0 μm thickness in the smooth side of the carrier foil, and the electrodeposited copper foil layer is composed of a bulk layer and fine copper particles on the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. --

Please replace the paragraph beginning at page 30, line 13, with the following rewritten paragraph:

-- The copper foils described ~~in claim 5 and claim 6~~ are in some of these embodiments electrodeposited copper foils with carrier each comprising the additional metal layer with the prescribed thickness positioned in the surface of the carrier foil made of a metal having the smooth surface with 0.05 to less than 4.0 μm roughness (Rz) and the electrodeposited copper foil positioned in the surface of the cobalt layer

and FIG. 8 shows the schematic cross-sectional structure. The copper foils are to be employed for laser processing after being processed to be copper clad laminates and then etched to remove the carrier foils and the shape of the surface of the additional metal layers is affected by the shape of the surface of the carrier foils. Consequently, the balance of the roughness of the surface of carrier foils and the thickness of the additional metal layers becomes an important factor.--

Please replace the paragraph beginning at page 31, line 8, with the following rewritten paragraph:

--The copper foils ~~described in claim 5 and claim 6~~ of certain of these embodiments after removal of the carrier foils become similar copper foils to those ~~described in claim 1 and claim 2~~ previously discussed. Consequently, because of the same reasons as described above, the additional metal layers to be formed on the carrier foils of metals each having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, are required to have the thickness controlled to be 0.08 to 2.0 μm in the case of the nickel layer and to be 0.05 to 3.0 μm in the case of the cobalt layer. Also, the role which the additional metal layers; the nickel layer and the cobalt layer; have to perform at the time of processing by laser beam is same as ~~described in the description of claim 1 and claim 2~~ in these previously discussed embodiments and the reason for the restriction of the thickness of the nickel layer and the cobalt layer is also same, so that duplicated explanation is omitted here. --

Please replace the paragraph beginning at page 31, line 23, with the following rewritten paragraph:

-- ~~Claim 7 describes an~~ One of these embodiment comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the additional metal layer is a nickel layer or a cobalt layer with the thickness of 0.03 to 1.0 μm thickness in the smooth surface side of the carrier foil, and the electrodeposited copper foil layer only comprises fine copper particles in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. As being understood from the schematic cross-sectional view of FIG. 9, the electrodeposited copper foil layer comprises only fine copper particles and has no bulk copper to be a conductor of a circuit of a printed circuit board, so that practically it cannot be used as it is for the use for a printed circuit board.--

Please replace the paragraph beginning at page 32, line 13, with the following rewritten paragraph:

-- However, if the electrodeposited copper foil with carrier described ~~in claim 7~~ herein is used for an outer layer copper foil of a copper clad laminate, the following use manner is made possible and the laser processibility becomes extremely excellent. If a copper clad laminate is manufactured using the electrodeposited copper foil with carrier, at first, the carrier foil is to be removed by etching. On completion of the

removal of the carrier foil, the additional metal layer of nickel or cobalt becomes a surface of the copper clad laminate. Consequently, the laser hole formation processing is to be carried out in this stage. At that time, if no bulk copper exists, the copper amount to be evaporated is about a half or less as compared with that in the case where the bulk copper exists and it becomes sufficient to evaporate only the copper in the fine copper particle state. Moreover, since the fine copper particles have approximately spherical shapes, even if they are deposited evenly, they keep a constant convexoconcave shape to lower the reflectance of laser and increase the laser processing efficiency. Therefore, heat quantity exceeding the above-described boiling point of nickel or cobalt affect to make laser processing easy to be carried out. --

Please replace the paragraph beginning at page 34, line 13, with the following rewritten paragraph:

-- Further, ~~claim 8 describes~~ another of these embodiments comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a smooth surface with the roughness (Rz) of 4.0 to 20.0 μm, the additional metal layer is a nickel layer with the thickness of 0.05 to 2.0 μm thickness in the matte side of the carrier foil, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation and ~~claim 9 describes~~ yet another of

these embodiments comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a smooth surface with the roughness (Rz) of 4.0 to 20.0 μm, the additional metal layer is a cobalt layer with the thickness of 0.03 to 3.0 μm thickness in the matte side of the carrier foil, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. --

Please replace the paragraph beginning at page 35, line 9, with the following rewritten paragraph:

--The electrodeposited copper foils ~~described in claim 8 and claim 9~~ of certain of these embodiments mean electrodeposited copper foil with carriers each comprising a nickel layer with the thickness of 0.05 to 2.0 μm or a cobalt layer with the thickness of 0.03 to 3.0 μm on the surface of the carrier foil made of a metal having the matte side with 4.0 to 20.0 μm roughness (Rz) and the electrodeposited copper foil positioned in the surface of the cobalt layer and FIG. 10 shows the schematic cross-sectional structure. The copper foils are to be employed for laser processing after being processed to be copper clad laminates and then etched to remove the carrier foils and the shape of the surface of the additional metal layers is affected by the shape of the surface of the carrier foils and the additional metal layers have the transferred roughened surface shapes, or mirror shapes of the carrier foils.--

Please replace the paragraph beginning at page 35, line 24, with the following rewritten paragraph:

-- Consequently, the electrodeposited copper foils ~~described in claim 8 and claim 9~~ of those embodiments after the removal of the carrier foils are similar to the copper foils described ~~in claim 3 and claim 4~~ elsewhere herein. Consequently, because of the same reasons described above, the additional metal layers to be formed on the carrier foils of a metal having the matte side with the roughness (Rz) of 4.0 μm to 20.0 μm are required to have the thickness controlled within a range of 0.05 to 2.0 μm thickness in the case of a nickel layer and within a range of 0.03 to 3.0 μm thickness in the case of a cobalt layer. In this case also, the role which the additional metal layers; the nickel layer and the cobalt layer; have to perform at the time of processing by laser beam is same as described ~~in the description of claim 1 and claim 2~~ elsewhere herein and the reason for the restriction of the thickness of the nickel layer and the cobalt layer is also same, so that duplicated explanation is omitted here.--

Please replace the paragraph beginning at page 36, line 12, with the following rewritten paragraph:

-- ~~Claim 10 describes an~~ One of these embodiments comprises an electrodeposited copper foil with carrier having a three-layer structure composed of a carrier foil layer, an additional metal layer, and an electrodeposited copper foil layer, wherein the carrier foil is of a metal material having a matte side with the roughness (Rz) of 4.0 μm 20.0 μm, the additional metal layer is a nickel layer or a cobalt layer with

the thickness of 0.03 to 1.0 μm thickness in the matte side of the carrier foil, and the electrodeposited copper foil layer only comprises fine copper particles in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. FIG. 11 shows the schematic cross-sectional view. The electrodeposited copper foil with carrier is only different from the electrodeposited copper foil with carrier described ~~in claim 7~~ elsewhere herein in the roughness of the face of the carrier foils on which additional metal layers are to be formed. So that, in addition to the effects as described ~~in claim 7~~ elsewhere herein, the effect which the roughness of the carrier foil provides is added. The effect caused owing to the utilization of the matte side is same as that described ~~in claim 3 and claim 4~~ previously and the description will be duplicated and therefore is omitted. --

Please replace the paragraph beginning at page 37, line 7, with the following rewritten paragraph:

-- The reason for the restriction of a carrier foil to a metal material in the electrodeposited copper foil with certain carriers described ~~in claim 5 to claim 10~~ herein is because the means for removing the carrier foil is assumed to be an etching method. Consequently, the reason for taking no organic conductive film or the like into consideration is because no effective means equivalent to the effective etching method effectively capable of swelling and removing the organic film has been found presently.-

Please replace the paragraph beginning at page 37, line 16, with the following rewritten paragraph:

– Consequently, the metal material to be employed for the carrier foil for the electrodeposited copper foil with certain carriers ~~decried in claim 5 to claim 10~~ is assumed to be aluminum, copper, and an iron-based alloy. As described ~~in claim 5 and claim 6~~ elsewhere herein, in the case where the smooth face of the carrier foil is employed, proper rolled materials of the above-described materials may be employed. The thickness of the carrier foil is not particularly restricted, however the upper limit value is spontaneously to be determined by the manufacture process and the structure of the apparatus employed. In the case where manufacturing is carried out using so-called surface treatment apparatus as described later, the carrier foil itself meanders and moves in a winding manner in the apparatus and for that, it can be said that the upper limit is 210 μm in the case of aluminum and copper and 180 μm in the case of an iron-based alloy taking that the moving state of the meandering carrier foil has to be stabilized and that the carrier foil is finally wound as a product of an electrodeposited copper foil with carrier into consideration.--

Please replace the paragraph beginning at page 38, line 16, with the following rewritten paragraph:

– ~~The~~ Certain copper foils ~~described in claim 5 to claim 7~~, as described above, are to comprise the carrier foils of a metal having a smooth surface with the roughness (Rz) of 0.05 μm to less than 4.0 μm and ~~the~~ another electrodeposited copper foil with

carrier described herein ~~in claim 8 to claim 10~~, being different from the electrodeposited copper foil with carriers as described ~~in claim 5 to claim 7~~ above, are to comprise the carrier foils of a metal having a matte face with the roughness (Rz) of 4.0 μm to less than 20.0 μm. The former roughness range allows usage of the matte sides of electrodeposited copper foils with any thickness from nominal thickness of 12 to 210 μm for the carrier foils. In the case of the latter, taking the above-described relation between the roughness of the matte side of the carrier foils and the reflectance of laser, it is advantageous to use the matte side of electrodeposited copper foils with the nominal thickness of 12 to 70 μm for the carrier foils.--

Please replace the three paragraphs beginning at page 40, line 26, with the following rewritten paragraphs:

--As a manufacturing method of an electrodeposited copper foil with carrier for processing for laser hole formation as ~~described in claim 5 to claim 10~~ described above, it is preferable to manufacture it using the above-described surface treating apparatus. That is because a carrier foil is generally wound and treating the carrier foil in web state continuously without disconnection is preferable from the production yield point of view.--

Please replace the paragraph beginning at page 41, line 20, with the following rewritten paragraph:

--To explain along the arrangement order of the tanks, since the pickling tank is

same as explained in the manufacture method of the copper foils described ~~in claim 1 and claim 4~~ previously, the explanation is omitted. Further, the additional metal layer formation tank for forming an additional metal layer on the surface of a carrier foil and the solutions to be employed for the additional metal layer formation are also similar to those described above, so that the description to be duplicated is omitted.--

Please replace the paragraph beginning at page 42, line 24, with the following rewritten paragraph:

--In this case, if bulk copper is not formed in the formation tank for the bulk copper layer, it is easy to obtain an electrodeposited copper foil with carrier for processing for laser hole formation as described ~~in claim 7~~ for certain embodiments, which comprises only fine copper particles as an electrodeposited copper foil on the carrier foil.--

Please replace the paragraph beginning at page 43, line 3, with the following rewritten paragraph:

--Then, on completion of the bulk copper layer formation, as a process for forming fine copper particles on the surface of the bulk copper layer, the resulting carrier foil is led to a surface-nodular treatment tank. If the bulk copper is not formed, fine copper particles are to be formed directly on the additional metal layer. The treatment carried out in the surface-nodular treatment tank and conditions, the contents of the anti-corrosion treatment and the drying process are same as those in the case of

manufacturing the surface treated copper foils as described ~~in claim 1 to claim 4~~ elsewhere herein, so that detailed description here is omitted.--

Please replace the paragraph beginning at page 43, line 14, with the following rewritten paragraph:

--Then, the description given is regarding peelable electrodeposited copper foil with carriers for processing laser hole formation ~~as described in claim 11 to claim 16~~. ~~Claim 11 describes~~ One embodiment is an electrodeposited copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an additional metal layer and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the release layer is formed using an organic agent or a metal material on the smooth face side of the carrier foil, a nickel layer with the thickness of 0.08 to 2.0 μm thickness is formed as the additional metal layer on the surface of the release layer, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles is formed in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. The schematic cross-sectional view is illustrated in FIG. 13.--

Please replace the paragraph beginning at page 44, line 5, with the following rewritten paragraph:

--~~Claim 12 describes~~ Another embodiment comprises an electrodeposited

copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an additional metal layer and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the release layer is formed using an organic agent or a metal material on the smooth face side of the carrier foil, a cobalt layer with the thickness of 0.05 to 3.0 μm thickness is formed as the additional metal layer on the surface of the release layer, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles is formed in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. The schematic cross-sectional view is illustrated in FIG. 13.--

Please replace the paragraph beginning at page 44, line 21, with the following rewritten paragraph:

--~~Claim 13 describes~~ Yet another embodiment comprises an electrodeposited copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an additional metal layer and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a smooth surface with the roughness (Rz) of 0.05 to less than 4.0 μm, the release layer is formed using an organic agent or a metal material on the smooth face side of the carrier foil, a nickel layer or a cobalt layer with the thickness of 0.03 to 1.0 μm is formed as the additional metal layer on the surface of the release layer, and the

electrodeposited copper foil layer comprising only fine copper particles is formed in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation, which is an electrodeposited copper foil with carrier having no bulk layer. The schematic cross-sectional view is illustrated in FIG. 14.--

Please replace the paragraph beginning at page 45, line 11, with the following rewritten paragraph:

--~~Claim 14 describes~~ Yet another embodiment comprises an electrodeposited copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an additional metal layer and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a matte side with the roughness (Rz) of 4.0 μm to 20.0 μm, the release layer is formed using an organic agent or a metal material on the matte side of the carrier foil, a nickel layer with the thickness of 0.05 to 2.0 μm thickness is formed as the additional metal layer on the surface of the release layer, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles is formed in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. The schematic cross-sectional view is illustrated in FIG. 15.--

Please replace the paragraph beginning at page 45, line 27, with the following rewritten paragraph:

--~~Claim 15 describes~~ Yet another embodiment comprises an electrodeposited

copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an additional metal layer and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a matte side with the roughness (Rz) of 4.0 μm 20.0 μm, the release layer is formed using an organic agent or a metal material on the matte side of the carrier foil, a cobalt layer with the thickness of 0.03 to 3.0 μm thickness is formed as the additional metal layer on the surface of the release layer, and the electrodeposited copper foil layer comprising a bulk layer and fine copper particles is formed in the surface of the additional metal layer to be an electrodeposited copper foil with carrier for processing for laser hole formation. The schematic cross-sectional view is illustrated in FIG. 15. --

Please replace the paragraph beginning at page 46, line 15, with the following rewritten paragraph:

--~~Claim 16 describes~~ Yet another embodiment comprises an electrodeposited copper foil with carrier composed of a carrier foil, a release layer formed on the surface of the carrier foil, and an electrodeposited copper foil layer formed on the release layer, wherein the carrier foil is of a film or a metal material having a matte side with the roughness (Rz) of 4.0 μm 20.0 μm, the release layer is formed using an organic agent or a metal material on the matte side of the carrier foil, a nickel layer or a cobalt layer with the thickness of 0.03 to 1.0 μm is formed as the additional metal layer on the surface of the release layer, and the electrodeposited copper foil layer comprising only fine copper particles is formed in the surface of the cobalt layer to be an

electrodeposited copper foil with carrier for processing for laser hole formation. The schematic cross-sectional view is illustrated in FIG. 16. --

Please replace the paragraph beginning at page 47, line 3, with the following rewritten paragraph:

--As being made clear from the description described above, the electrodeposited copper foil with carriers for processing for laser hole formation ~~of claim 11 to claim 16~~ described in the preceding paragraphs are different from the electrodeposited copper foil with carriers for processing for laser hole formation ~~of claim 5 to claim 10~~ described earlier in the point that the release layers using organic agents are formed in the interface between the carrier foils and the additional metal layers. Consequently, the supposed meaning of the carrier foils, the assumed roles of the additional metal layers of nickel or cobalt, the meanings of the numeral values of the thickness in the ranges, and the meaning of the formation of the electrodeposited copper foil layers comprising only the fine copper particles are same and therefore the description to be duplicated is omitted.--

Please replace the paragraph beginning at page 47, line 17, with the following rewritten paragraph:

--Also, regarding the manufacturing method of copper foils described in ~~claim 11 to claim 16~~ the preceding paragraphs, the point different from the manufacturing method of the copper foils described ~~in claim 5 to claim 10~~ earlier is only that the

organic release layers are formed after pickling of the carrier foils to form the organic junction interfaces and then the additional metal layers are formed. According to that, a manufacturing method for an electrodeposited copper foil with carrier described in claims is a manufacturing method of an electrodeposited copper foil with carrier comprising steps of unwinding a carrier foil rolled in a roll state in one direction and subjecting the carrier foil to the electrodeposited copper foil layer formation process properly equipped with water-rinsing treatment tanks by passing the carrier foil respectively through an pickling tank, a release layer formation tank, an additional metal layer formation tank, a formation tank for forming a bulk copper layer to be the electrodeposited copper foil layer, a surface nodular treatment tank for forming fine copper particles on the surface of the bulk copper layer, an anti-corrosion treatment tank, and a drying part, which are continuously arranged, to continuously form the release layer of an organic type agent and the electrodeposited copper foil layer on the carrier foil. The flow of the manufacturing method is illustrated in FIG. 17.--

Please replace the paragraph beginning at page 49, line 10, with the following rewritten paragraph:

--As described ~~in claims~~ herein, the organic agent here is preferably 1 or more compounds selected from nitrogen-containing organic compounds, sulfur-containing organic compounds, and carboxylic acids. --

Please replace the paragraph beginning at page 50, line 24, with the following rewritten

paragraph:

--The formation of the release layer using an organic agent may be carried out~~,~~ ~~as described in claims,~~ using a solution in which one or more compounds selected from the nitrogen-containing organic compounds, the sulfur-containing organic compounds, and the carboxylic acids or, ~~as described in claims,~~ applying one of organic agents or a mixture of two or more organic agents selected from the nitrogen-containing organic compounds, the sulfur-containing organic compounds, and carboxylic acids repeatedly a plurality of times. In such a manner, the thickness of the release layer can be controlled highly precisely.--

Please replace the paragraph beginning at page 53, line 3, with the following rewritten paragraph:

--These organic agents are generally not conductive materials but materials having an insulating property. Consequently, certain of the electrodeposited copper foils with carrier ~~according to claim 11 to claim 16~~ are required to comprise the carrier foil itself polarized as a cathode, to be capable to directly electrodeposit copper on the release layer of the organic agents formed on the carrier foil and to be electrically conductive through the release layer. That is, the thickness of the release layer of the organic agents is naturally restricted and should be proper to keep the proper releasing strength and also stably carry out electrodeposition of copper.--

Please replace the paragraph beginning at page 53, line 15, with the following rewritten

paragraph:

-- Consequently, it is not so important what kind of a release layer is formed using which solvent to melt the organic agent in which concentration and how long duration the treatment is carried out, but the thickness of the consequently formed release layer, in other words, the quantity of the organic agents existing in the release layer is important. Regarding that, ~~claims clarify~~ the thickness of the release layer formed using an organic agent is preferable to be in a range of 1 nm to 1 μm.--

Please replace the paragraph beginning at page 55, line 17, with the following rewritten paragraph:

--To use ~~the~~ certain electrodeposited copper foils with carrier as described ~~in claim 11 to claim 16~~ herein makes it easy to release carrier foils from copper clad laminates after the copper clad laminate are manufactured. Consequently, these claims describe copper clad laminates obtained using the electrodeposited copper foil with carriers as described ~~in claim 5 to claim 49 and~~ herein for copper foil assemblies are capable of providing the same effect as that the case of using the surface treated copper foils ~~described in claim 1 to claim 4~~ for printed circuit boards after the carrier foils are released and of effectively lowering the manufacturing cost of printed circuit boards for fine pitch circuits.--

Please replace the paragraph beginning at page 56, line 23, with the following rewritten paragraph:

--EXAMPLE 1:

In this example, a surface treated copper foil 1 according to ~~claim 1~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 7 and was a type where an unwound deposited foil 3 for manufacturing a copper foil with a nominal thickness of 9 μm was moved in a winding manner through the respective tanks of the manufacturing apparatus 2. Here, an additional metal layer 5 using nickel with the thickness of 1 μm was formed in the shiny side 4 of the deposited foil 3. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series.--

Please replace the paragraph beginning at page 60, line 4, with the following rewritten paragraph:

--EXAMPLE 2:

In this example, ~~a~~ another surface treated copper foil 1 according to ~~claim 2~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 7 and was a type where an unwound deposited foil 3 for manufacturing a copper foil with a nominal thickness of 9 μm was moved in a winding manner through the respective tanks of the manufacturing apparatus 2. Here, an additional metal layer 5 using cobalt with the thickness of 1 μm was formed in the shiny side 4 of the deposited foil 3. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however since only the solution filling the inside of the additional metal layer formation

tank 7 was different and other than that, the rest were same as those in the example 1, the description of the common portions is omitted and only the different portion will be described.--

Please replace the paragraph beginning at page 61, line 14, with the following rewritten paragraph:

--EXAMPLE 3:

In this example, ~~a~~ yet another surface treated copper foil 1 according to ~~claim 3~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 7 and was a type where an unwound deposited foil 3 for manufacturing a carrier foil with a nominal thickness of 9 μm was moved in a winding manner through the respective tanks of the manufacturing apparatus 2. Here, an additional metal layer 5 using nickel with the thickness of 1 μm was formed in the matte side 8 side of the deposited foil 3.--

Please replace the paragraph beginning at page 62, line 20, with the following rewritten paragraph:

--EXAMPLE 4:

In this example, ~~a~~ yet another surface treated copper foil 1 according to ~~claim 4~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 7 and was a type where an unwound deposited foil 3 for manufacturing a copper foil with a nominal thickness of 9 μm was moved in a winding

manner through the respective tanks of the manufacturing apparatus 2. Here, an additional metal layer 5 using cobalt with the thickness of 1 μm was formed in the matte side 8 side of the deposited foil 3.--

Please replace the paragraph beginning at page 63, line 24, with the following rewritten paragraph:

--EXAMPLE 5:

In this example, an electrodeposited copper foil with carrier 15 according to ~~claim 5~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series.--

Please replace the paragraph beginning at page 67, line 28, with the following rewritten paragraph:

--EXAMPLE 6:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according

to ~~claim 6~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a cobalt layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however since only the solution filling the inside of the additional metal layer formation tank 7 was different and other than that, the rest were same as those in the example 5, the description of the common portions is omitted and only the different portion will be described.--

Please replace the paragraph beginning at page 69, line 17, with the following rewritten paragraph:

--EXAMPLE 7:

In this example, ~~an~~ yet another electrodeposited copper foil with carrier 15 according to ~~claim 7~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm

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was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 comprising only the fine copper particles 9. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however since only the difference was that the formation process of the bulk copper layer 23 was omitted in the example 5 and the rest processes were same as those of the example 5, the description to be duplicated is omitted.--

Please replace the paragraph beginning at page 70, line 26, with the following rewritten paragraph:

--EXAMPLE 8:

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In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 8~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the matte side 8 side to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however the treatment procedure was completely same as that of the example 5 and there was no different point.--

Please replace the paragraph beginning at page 72, line 7, with the following rewritten paragraph:

--EXAMPLE 9:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 9~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a cobalt layer with the thickness of 1 μm was formed as an additional metal layer 5 in the matte side 8 side to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however the treatment procedure was completely same as that of the example 6 and there was no different point. --

Please replace the paragraph beginning at page 73, line 12, with the following rewritten paragraph:

--EXAMPLE 10:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 10~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 12 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface

treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the matte side 8 side to form an electrodeposited copper foil layer 21 comprising only the fine copper particles 9. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series, however since only the difference was that the formation process of the bulk copper layer 23 was omitted in the example 8 and the rest processes were same as those of the example 8, the description to be duplicated is omitted. --

Please replace the paragraph beginning at page 74, line 26, with the following rewritten paragraph:

--EXAMPLE 11:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 11~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in

series.--

Please replace the paragraph beginning at page 76, line 21, with the following rewritten paragraph:

--EXAMPLE 12:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 12~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a cobalt layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series.--

Please replace the paragraph beginning at page 78, line 16, with the following rewritten paragraph:

--EXAMPLE 13:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 13~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unwound carrier

foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 comprising only fine copper particles 9. Hereafter, the manufacturing conditions will be described in the order of the respective types of the tanks continuously arranged in series.--

Please replace the paragraph beginning at page 80, line 11, with the following rewritten paragraph:

--EXAMPLE 14:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 14~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a nickel layer with the thickness of 1 μm was formed as an additional metal layer 5 in the matte side 8 side to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Consequently, the manufacturing processes and the manufacturing conditions were same as those of the example 11 and description will be duplicated and therefore the description is omitted.--

Please replace the paragraph beginning at page 81, line 20, with the following rewritten paragraph:

--EXAMPLE 15:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 15~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unwound carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness was used as the carrier foil 20 and a cobalt layer with the thickness of 1 μm was formed as an additional metal layer 5 in the matte side 8 side to form an electrodeposited copper foil layer 21 with the thickness of 3 μm. Consequently, the manufacturing processes and the manufacturing conditions were same as those of the example 12 and description will be duplicated and therefore the description is omitted.--

Please replace the paragraph beginning at page ~~5~~ 83, line ~~27~~ 1, with the following rewritten paragraph:

--EXAMPLE 16:

In this example, ~~an~~ another electrodeposited copper foil with carrier 15 according to ~~claim 16~~ the present invention will be described. The surface treating apparatus 2 employed here was that illustrated in FIG. 17 and was a type where an unrolled carrier foil 20 was moved in a winding manner through the respective tanks of the surface treating apparatus 2. Here, a deposited foil classified in grade 3 of 18 μm thickness

was used as the carrier foil 20 and a cobalt layer with the thickness of 1 μm was formed as an additional metal layer 5 in the shiny side 4 to form an electrodeposited copper foil layer 21 comprising only fine copper particles 9. Consequently, the manufacturing processes and the manufacturing conditions were same as those of the example 13 and description will be duplicated and therefore the description is omitted.--